# ISO/IEC JTC1/SC22/WG9 N 562

### Meeting Minutes

Revision 1 13 June 2016

### Meeting #70 of ISO/IEC JTC 1/SC 22/WG 9

Monday 13 June 2016 in Pisa, Italy

In accordance with Resolution 69-4, meeting #70, of WG 9 was held in conjunctions with the [Ada-Europe 2016 Conference](http://www.cister.isep.ipp.pt/ae2016/) in the afternoon of Monday 13 June 2016 in Pisa, Italy. The meeting began at 14:35 in the Grey room at TeCIP Institute.

The detailed agenda was circulated as [N561](#N561).

### AGENDA

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[Convenor’s Report](#Convenor)

[Project Editor Reports (as needed)](#ProjEds)

IS 8652: Jeff Cousins, Ed Schonberg, and Randy Brukardt

IS 15291: Bill Thomas and Greg Gicca

TR 15942: Brian Wichmann

IS 18009: Erhard Ploedereder

TR 24718: Alan Burns

[Rapporteur Group Reports (as needed)](#Rapporteurs)

Report of Ada Rapporteur Group: Jeff Cousins, Chair

Report of Annex H Rapporteur Group: Alan Burns, Chair

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Recess

### Opening Orders

Call to Order

Appointment of Meeting Secretary - Alok Srivastava

Welcome and Administrative Arrangements

Approval of the [Agenda](#Agenda)

Approval of [N558](#n558): Meeting #69 Minutes. Resolution [70-1](#r1).

### National Body Reports and Introductions

### Canada – Brad Moore (HOD), Stephen Michell

Canada was represented at the recent IRTAW meeting, held in Benicassim, Spain, in April 2016.

Canada continues its involvement in exploring parallelism extentions for Ada. There have been many ideas discussed, but more time is needed to select an approach for parallel looping constructs. Feedback from ARG members would be helpful.

The Canadian delegation for the Pisa meeting consists of Brad Moore (HOD), and Stephen Michell

### Italy – Tullio Vardanega

Nothing to report.

### Portugal – Luis Miguel Pinho

There are no changes to report. National work related to WG 9 continues to be in direct connection with the NB. Portugal is a P member of SC 22, but AFAIK WG 9 is the only WG active in the SC. The main focus of the technical work being developed continues to be in the parallelism extensions being proposed for Ada.

### Spain – Juan Antonio de la Puente (HOD)

Spanish members of the HRG participated in the IRTAW 16 meeting that was held in Benicassim, Spain, in April 2016.

There has been no further significant activity in the period from the last WG9 meeting.

The Spanish delegation for this meeting of WG 9 is Juan Antonio de la Puente (HOD).

### Switzerland – Nicholas Kaethner (apologies)

Nothing to report.

### UK – Jeff Cousins (HOD), John Barnes, Alan Burns

The UK will hold a meeting in a month or two to brief the Ada Panel of the Corrigendum and progress since.

### USA – Tucker Taft, Steve Baird, Randy Brukardt

Nothing to report

### Guests – JP Rosen, Florian Schanda

### Liaison Reports and Introductions

**Ada Europe –** Dirk Craeynest

Ada-Europe Liaison Report to WG9 for meeting #70
Ada-Europe Liaison Representative, Dirk Craeynest

Ada-Europe would like to inform the WG9 convener that it will send a 2-person Ada-Europe liaison delegation to Meeting #70 in Pisa, Italy, on Monday 13 June 2016.

The delegation consists of:

- Erhard Ploedereder
- Dirk Craeynest (presenter)

Since the previous WG9 meeting, two international events were held that were organized in cooperation with Ada-Europe: the 7th Ada Developer Room [1] at FOSDEM 2016 on January 30, 2016, in Brussels, Belgium, and the International Real-Time Ada Workshop (IRTAW-18) [2] on April 11-13, 2016, in Benicàssim, Spain.

The FOSDEM event was again well attended and sparked quite some interest. The grant provided by Ada-Europe to IRTAW-18 was put to good use in facilitating a high-quality event, with good level of participation (in line with past years), predominantly from Europe, valuable technical proceedings and good prospects for the future.

[1] <http://www.cs.kuleuven.be/~dirk/ada-belgium/events/16/160130-fosdem.html>
[2] <http://www.ada-europe.org/irtaw2016>

The next Ada-Europe conference will be held on June 12-16, 2017, in Vienna, Austria, and we reconfirm our usual hospitality agreement for WG 9, ARG and HRG, as well as for WG 23. The Preliminary Call for Papers is distributed at this conference.

Although no firm decisions have been taken yet, we are expecting the Ada-Europe 2018 conference to be organized around mid June 2018 in Lisbon, Portugal.

We reconfirm our willingness to support the Ada standardization related activities.

Finally, the status of the Ada User Journal (AUJ) remains healthy. Four issues are published each year with, apart from the traditional Quarterly News Digest, Conference Calendar and Forthcoming Events sections, several articles, material from the industrial track and
tutorials of the Ada-Europe conference, proceedings of workshops which took place at Ada-Europe conferences, etc. Highlight for last year was the commemoration of the Bicentennial anniversary of Ada Lovelace, with the AUJ running a series of articles on Ada Lovelace during 2015.

**SIGAda –** David Cook (apologies)

SIGAda has had no significant changes since the last report. We have finalized plans for our upcoming workshop. We are now accepting papers for the ACM SIGAda’s High Integrity Language Technology International Workshop on Model-Based Development and Contract-Based Programming.  The HILT workshop will be held October 6-7, 2016 at the Pittsburg Marriott City Center, Pittsburgh, Pennsylvania (USA), as part of Embedded Systems Week (ESWEEK).  Details (and paper submission guidelines) can be found at the SIGAda website.

David Cook, Chair, SIGAda

**WG 23 –** Erhard Ploedereder

Since the last WG9 meeting in Vermont, WG 23 has met in five 2-hour teleconferences and two face-to-face-meetings. The main subject of the work of WG 23 over the past six months has been the Vulnerabilities document, now split into 8 parts. SC22 apparently has agreed to the split, since individual parts show up on the official ISO lists of ongoing work.

The TeleCons (Oct. 21st, Nov. 23rd, Feb. 8th, March 7th, and May 16th) mainly served to review and integrate changes made to the documents in response to assignments made at previous meetings. Also, upcoming face-to-face meetings were prepared.

At the face-to-face meeting in Orlando, Florida, Jan. 11th + 12th, TR-24772 was reviewed in light of comments and additions received and not yet handled. Action items for the development of wording were assigned. Updates to the cross-references to the evolving CWE, to JSF, Misra and C CERT rules or vulnerabilities were initiated. Remaining decisions about the structure of the language-specific Parts of the TR were made, e.g., about the contents of the split-up Bibliography (where each Part shall contain its own references and only those).

For the C-Annex, a new section with the “top N Guidelines” (N =~10 or 12, “Dirty Dozen”) was drafted. A similar attempt for Ada was initiated. The C++ Code Guidelines and their interrelationship with TR-24772 were examined: some are useful to cover vulnerabilities, but there are many C++ guidelines that have different objectives such as code efficiency or software engineering concerns. While worthwhile, many of these guidelines are outside the scope of WG 23 work. TS 17961, the C Secure Coding Rules, which was recently amended with a Technical Corrigendum, was discussed in the same context.

At the face-to-face meeting at the BSI offices in London, April 15th and 16th, the cooperation with WG 14 was explored in more detail. A partially joint meeting of WG 14 and WG 23 before the main WG 23 meeting discussed various apprehensions that WG 14 members wanted to voice. At the WG 23 meeting, we listed the many documents for C coding guidelines in existence today and discussed to what extent we should cite and use them. The role of Section 7 was examined in connection with the newly added time-related vulnerabilities. The latter were eventually moved into Section 7 as environment-related vulnerabilities hardly caused or prevented by programming language elements. Section 7 vulnerabilities should be reordered by general categories to provide a better flow to the reader. (As Section 7 plays no role in the language-dependent parts, WG 9 is not affected by this work.)

In the next few months, the monthly TeleCons will continue. Face-to-face meetings are planned for Vienna in September and Florida in January of 2017.

WG 23 thanks WG 9 for its efforts in updating the old Annex to become Part-3 of TR-24772 and expresses its hopes to receive the document from WG 9 for the WG 23 meeting starting on June 14th.

**FORTRAN, INCITS/PL22.3** – Van Snyder (apologies)

### Convenor's Report Activities since the Last Session

The Convenor provided the yearly report to INCITS; this document is available as [N560](#n560).

The ISO/IEC JTC 1/SC 22 voted for approval of the Technical Corrigendum to ISO/IEC 8652:2012 with editorial comments. The results of this vote can be found in [ISO-IECJTC-1-SC22 N5095](http://isotc.iso.org/livelink/livelink?func=ll&objId=17506372&objAction=Open&vernum=1). The Convenor made the editorial changes and the Technical Corrigendum was published in January 2016 as ISO/IEC 8652:2012/Cor 1:2016. The consolidated Ada Reference Manual, consisting of the [International Standard (ISO/IEC 8652:2012): *Information Technology – Programming Languages – Ada*](http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=69798), as updated by changes from the Technical Corrigendum 1 (ISO/IEC 8652:2012/Cor 1:2016) have been posted on the [Ada Information Clearinghouse website](http://www.adaic.org) as the [Consolidated Ada 2012 RM](http://www.ada-auth.org/standards/rm12_w_tc1/html/RM-TTL.html).

The Convenor contributed to the update of the [SC 22 Standard Document #2, JTC 1 History](http://isotc.iso.org/livelink/livelink?func=ll&objId=16486338&objAction=Open&vernum=2&nexturl=%2Flivelink%2Flivelink%3Ffunc%3Dsrch%2ESearchCache%26cacheId%3D1624196491).

The major accomplishments for this period are continued work on Defect Reports and Ada Issues on ISO/IEC 8652:2012 and the development of a new set of tests for the Ada Conformance Test Suite that are in alignment with the new edition of the standard.

There has been a slight modification to the membership of WG 9. Mr Alexandre Murgueiro is not longer participating in WG 9. Mr Filipe Martins has join WG 9.

### Meeting Objectives

The major objectives for this meeting are:

Update to the Ada and SPARK Parts to the WG 23 Technical Report on Vulnerabilities

[New Convenor](#nc)

[IRTAW Results](#ir2016)

Ada Issues and Ada 202X

Develop Technical Reports or Standards improving the Ada libraries

Consider proposals for extending the language

### Project Editor Reports (as needed)

### ISO/IEC 15291 (ASIS)

### ISO/IEC 18009 (Conformity Assessment of an Ada Language Processor) (Erhard Ploedereder)

No activities to be reported.

**IS 8652 (Information Technology--Programming Languages - Ada)** (Randy Brukardt)

As most of you are aware, the Technical Corrigendum for Ada 2012 (formally, ISO/IEC 8652:2012:Cor.1:2016) was published February 1st (it was actually available on the ISO site on January 28th).

Similarly to previous Ada updates, I've posted a consolidated RM version that combines the text of Ada 2012 with the corrections of the Corrigendum on <http://www.ada-auth.org> in various formats and configurations (the full listing can be found at <http://www.ada-auth.org/standards/ada12_w_tc1.html>). The working draft RM is also available on the Ada-Auth.org site.

**TR 15942 (Guidance for the Use of Ada in High Integrity Systems)**

See HRG Report

**TR 24718 (Guide for the Use of the Ravenscar Profile in High Integrity Systems)**

See HRG Report

### Rapporteur Group Reports (as needed)

**Rapporteur Report ARG**

The Ada 2012 standard has so far (posted by 31 May 2016) generated 186 Ada Issues (AIs).

The ARG met in Bennington, Vermont in October 2015, following a WG 9 meeting which had approved ten AIs.

Four regular and six amendment AIs were not discussed as they were awaiting action completion, only one of these (an amendment) is regarded as high priority.

Five of the regular AIs were approved as is or with changes, three (none high priority) require further investigation, and one was voted No Action.

Most of the amendment AIs were discussed. Six were approved with changes (59, 143, 144, 156, 163 & 175), four had their intent approved (9, 64, 125 & 128), three require further investigation, and seven were voted No Action.

As of 31 May 2016, 110 AIs had been approved by WG 9 (100 having already made it into the Corrigendum), 11 by the ARG but not yet by WG 9, and 33 (not counting variants) are work items for discussion at the ARG. Of the 33, 2 are ramifications, 11 are binding interpretations and 20 are amendments. (There is also an AI on presentation).

A number of AI's have completed (\*) editorial review and are ready for approval by WG 9. The list follows. As usual, the full text of the AI's can be found at [www.ada-auth.org/ais.html](http://www.ada-auth.org/ais.html).

AI12-0059-1/10 2016-04-25 -- Object\_Size attribute

AI12-0143-1/03 2015-11-19 -- Using an entry index of a family in a precondition

AI12-0144-1/07 2016-01-28 -- Make Discrete\_Random more flexible

AI12-0156-1/04 2016-04-11 -- Use subtype\_indication in generalized iterators

AI12-0163-1/04 2016-04-21 -- Deterministic queue servicing for FIFO\_Queueing

AI12-0172-1/01 2015-10-06 -- Raise expressions in limited contexts

AI12-0173-1/02 2015-11-17 -- Expression of an extended return statement

AI12-0174-1/02 2015-11-17 -- Aggregates of Unchecked\_Unions using named notation

AI12-0175-1/05 2016-03-22 -- Preelaborable packages with address clauses

AI12-0176-1/02 2016-01-28 -- 6.1.1(26.4/4) only applies to tagged types

AI12-0178-1/04 2016-04-25 -- Glitches in examples

Work on the ASIS standard remains paused.

Future meetings are scheduled for 11-13 June 2016 in Pisa, Italy, in conjunction with the Ada-Europe 2016 conference, and provisionally for 8-10 October 2016 in Pittsburgh, U.S.A., in conjunction with the SIGAda HILT Workshop.

Continuation of the ARG: Resolution [70-2](#r2).

Approval of AIs: Resolution [70-5](#r5).

**Rapporteur Report HRG**

Focus of work over last period has been on the Ada annex/part of the Vulnerabilities Report. A full draft is in the process of being completed and will be open to review. The Ada Part will be ready for distribution to WG 9 for editorial review no later than 1 July 2016. Action Item [70-1](#ai1). An email vote will be conducted for approval to forward to WG 23 no later than 15 Aug 2016. Action Item [70-2](#ai2).

WG 9 asked HRG to consider updating the TR 24718 concerned with the Guide for the use of the

Ada Ravenscar Profile in high integrity systems. The original report was based upon a technical report from the University of York (YCS 348(2003)) authored by Brian Dobbing, Tullio Vardanega and Alan Burns. All three authors are prepared to produce a new version. Given that the copyright for the original is held by the authors of this University of York report it is perhaps best to use the same route to produce a new version. Action Item [70-3](#ai3)

WG 9 also asked HRG to consider updating TR 15942 concerned with the Guide for the use of the Ada programming language in high integrity systems. AdaCore have been asked if they are prepared to take the lead on updating this report (as there is insufficient effort available to do this

solely from within the HRG working group). AdaCore have agree to take the lead and Ben Brosgol is representing them in this work. If WG 9 agree the intension is to produce a draft by Ada Europe 2017. Action Item [70-4](#ai4)

Ben Brosgol has agreed to become the editor of TR 15942. The Convenor will notify SC 22 of this change. Action Item [70-5](#ai5).

Continuation of the HRG: Resolution [70-3](#r3).

### Open Action Items and Unimplemented Resolutions

This is the "To Do" list for WG9. Some are informal action items assigned to various participants. Some are formal resolutions, which are not yet implemented. Some items are simply in suspense awaiting action by other groups.

**Action Item 68-2: S**teve Michell will report back to WG 9 at meeting #69 (Oct 2015) with respect to development and content of the SPARK Part.
Status: Closed

*Discussion:* Steve has been trying to coordinate with Florian to determine what is possible in this area. Steve will work with Tucker to get together with Florian. Steve will report back at meeting #70 on the progress here.

HRG is interested in taking ownership of the SPARK Part once the Ada Part has been completed. Florian said that he is prepared to be a reviewer of the SPARK Part rather than taking on the leadership role. The SPARK Part needs to be updated for the changes in SPARK as well as the changes in the vulnerabilities. WG 23 would like to see the format of the SPARK Part to be similar to the format of the Ada Part.

**Action Item 69-1**: Alan Burns will provide the status of the development of an update to the Technical Report TR 24718 (Guide for the Use of the Ravenscar Profile in High Integrity Systems) to incorporate any changes, e.g., IRTAW, SPARK, at the next WG 9 meeting, Meeting #70.

Status: Closed

**Action Item 69-2**: The HRG (Alan Burns) will work with AdaCore to develop a plan to update TR 15942 and present this plan at the next WG 9 meeting, Meeting #70.

Status: Closed

**Action Item 69-3**: Tucker Taft will work with SIGAda to inform WG 9 of the plans for the next meeting of SIGAda no later than 1 Dec 2015.

Status: Closed

Discussion: HILT Workshop will be held 6-7 Oct 2016

[AGENDA](#AA)

### Committee as a Whole

**New Convenor:** Dr. Patrick Rogers, from AdaCore, has been nominated to become the new convenor of WG 9. His approval is expected to be announced at the ISO/IEC JTC 1/SC 22 meeting in September in Vienna.

## Report to JTC 1/SC 22/WG 9 Ada - IRTAW 2016: Stephen Michell provided a summary of the work conducted at the 2016 edition of the International Real Time Ada Workshop which can be found in WG 9 document number N563. The primary areas of research investigated during this workshop were:

1. Deadline floor protocol issues,
2. Parallel programming issues,
3. Language issues,
4. Experience,
5. Language profiles, and
6. Time-based language vulnerabilities.

All the workshop position papers and session summaries will be published in the June 2016 edition of ACM Ada Letters.

### Unfinished Business

None

### New Business

None

### Scheduling of Future Meetings

The next meeting of WG 9, Meeting #71, will be held in conjunction with [ACM HILT 2016](http://www.sigada.org/conf/hilt2016/) on the morning of Oct 8 in Pittsburgh, PA.

The following meeting of WG 9, Meeting #72, will be held in conjunction with the [22ndInternational Conference on Reliable Software Technologies Ada-Europe 2017](http://www.ada-europe.org/conference2017), on the morning of 16 June 2017 in Vienna, Austria.

Resolution [70-4](#r4)

[AGENDA](#AC)

#### Review of New Action Items

**Action Item 70-1**:
Joyce Tokar, as the WG 9 Editor of the Ada Part of the WG 23 TR-24772, will distribute the Ada Part to WG 9 for an editorial review of a period of 21 day no later than 1 July 2016.

**Action Item 70-2**:

The Convernor of WG 9 will distribute the Ada Part for approval on a 21 day email ballot no later than 15 August 2016.

**Action Item 70-3**: Alan Burns and Tullio Vardenga will produce an update to TR 24718, Guide for the use of the Ada Ravenscar Profile in high integrity systems, for review at the WG 9 meeting #72 associated with Ada Europe 2017.

**Action Item 70-4**: Ben Brosgol will produce an initial draft update to TR 15942, Guide for the use of the Ada programming language in high integrity systems, for review at the WG 9 meeting #72 associated with Ada Europe 2017.

**Action Item 70-5**: The Convenor will notify ISO/IEC JTC 1/SC 22 of the change of editor of TR 15942 from Brian Wichman to Ben Brosgol.

### Final Consideration of Resolutions

#### Resolution 70-1:

The minutes of Meeting #69 contained in document [N558](#n558) are approved.

*This resolution passed unanimously*.

#### Resolution 70-2:

ISO/IEC JTC 1/SC 22/WG 9 continues its Ada Issues Rapporteur Group (ARG) until the next plenary meeting and expresses its grateful appreciation to the Rapporteur and the members for their continuing service.

Jeff Cousins is appointed as Rapporteur.

The membership of the ARG is designated to be: Raphaël Amiard, Steve Baird, John Barnes, Randy Brukardt, Alan Burns, Jeff Cousins, Gary Dismukes, Robert Duff, Pascal Leroy, Brad Moore, Erhard Ploedereder, Jean-Pierre Rosen, Florian Schanda, Ed Schonberg, Tucker Taft, and Tullio Vardanega.

The Convenor of WG 9 is authorized to act for WG 9 between meetings in appointing additional members of the ARG. In doing so, she shall consult with the Rapporteur and the National Body or Liaison Organization nominating the member.

Rapporteurs are permitted to allow other individuals to observe the deliberations of the Rapporteur Group. The admission of observers and the extent of participation permitted to observers are at the discretion of the Rapporteur with the concurrence of the membership of the Rapporteur Group.

*This resolution passed unanimously.*

##### Resolution 70-3:

ISO/IEC JTC 1/SC 22/WG 9 continues its Annex H Rapporteur Group (HRG) until the next plenary meeting and expresses its grateful appreciation to the Rapporteur and the members for their continuing service.

Alan Burns is continued as Rapporteur.

The membership of the HRG is designated to be: Steve Baird, John Barnes, Patrick de Bondeli, Alan Burns, Rod Chapman, Gary Dismukes, Bob Duff, Michael Gonzalez Harbour, Stephen Michell, Brad Moore, Miguel Pinho, Erhard Ploedereder, Juan Antonio de la Puente, George Romanski, Jean-Pierre Rosen, S. Tucker Taft, Joyce Tokar, Tullio Vardanega, and Brian Wichmann.

The Convenor of WG 9 is authorized to act for WG 9 between meetings in appointing additional members of the HRG. In doing so, she shall consult with the Rapporteur and the National Body or Liaison Organization nominating the member.

Rapporteurs are permitted to allow other individuals to observe the deliberations of the Rapporteur Group. The admission of observers and the extent of participation permitted to observers are at the discretion of the Rapporteur with the concurrence of the membership of the Rapporteur Group.

*This resolution passed unanimously.*

##### Resolution 70-4:

ISO/IEC JTC 1/SC 22/WG 9 schedules future meetings as follows:

Meeting #71 in conjunction with [ACM HILT 2016](http://www.sigada.org/conf/hilt2016/) on the morning of Oct 8 in Pittsburgh, PA.

Meeting #72 in conjunction with the [22nd International Conference on Reliable Software Technologies Ada-Europe 2017](http://www.ada-europe.org/conference2016), on the morning of 16 June 2017 in Vienna, Austria.

*This resolution passed unanimously.*

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[AGENDA](#AD)

### Review of New Resolutions

**Resolution 70-5:**

AI12-0059-1/10 2016-04-25 -- Object Size attribute

AI12-0143-1/03 2015-11-19 -- Using an entry index of a family in a precondition

AI12-0144-1/07 2016-01-28 -- Make Discrete\_Random more flexible

AI12-0156-1/04 2016-04-11 -- Use subtype\_indication in generalized iterators

AI12-0163-1/04 2016-04-21 -- Deterministic queue servicing for FIFO\_Queueing

AI12-0172-1/01 2015-10-06 -- Raise expressions in limited contexts

AI12-0173-1/02 2015-11-17 -- Expression of an extended return statement

AI12-0174-1/02 2015-11-17 -- Aggregates of Unchecked\_Unions using named notation

AI12-0175-1/05 2016-03-22 -- Preelaborable packages with address clauses

AI12-0176-1/02 2016-01-28 -- 6.1.1(26.4/4) only applies to tagged types

AI12-0178-1/04 2016-04-25 -- Glitches in examples

These AIs are hereby approved by WG9.

*This resolution passed unanimously.*

[AGENDA](#AD)

### Appreciation

**Resolution 70-6:**

ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to Ada Europe their gracious accommodations for Meeting #70.

*This resolution passed unanimously.*

**Resolution 70-7:**

ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to Clyde Roby for his continuing service in maintaining the WG 9 Web Page.

*This resolution passed unanimously.*

##### Resolution 70-8:

ISO/IEC JTC 1/SC 22/W 9 expresses its grateful appreciation to Alok Srivastava for acting as secretary for Meeting #70.

*This resolution passed unanimously.*

##### Resolution 70-9:

ISO/IEC JTC 1/SC 22/WG 9 expresses its grateful appreciation to Joyce Tokar for convening Meeting #70 and for many years of dedicated service to the goals of WG 9.

*This resolution passed unanimously.*

[AGENDA](#AF)

Recess –

The meeting ended at 16:30. The Convenor recessed the meeting subject to a call to resume. ISO/IEC JTC 1/SC 22/WG 9 designated experts may anticipate email ballots to be conducted during the months between this meeting and the next one.

[AGENDA](#AG)

## REFERENCES

### Relevant WG9 Documents

[ISO/IEC 8652:2012](http://www.iso.org/iso/home/store/catalogue_ics/catalogue_detail_ics.htm?csnumber=61507) Information Technology--Programming Languages—Ada

[ISO/IEC 8652:2012/COR. 1:2016](http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=69798), Technical Corrigendum to Information Technology – Programming Languages – Ada.

[ISO/IEC 8652:1995](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=22983) Information Technology--Programming Languages—Ada

[ISO/IEC 8652:1995/COR.1:2001](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=35451), Technical Corrigendum to Information Technology--Programming Languages—Ada

[ISO/IEC 8652:1995/AMD.1:2007](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=45001), Amendment to Information Technology--Programming Languages—Ada

[N388](http://www.open-std.org/jtc1/sc22/wg9/n388.htm), Request for Subdivision of Project ISO/IEC 8652:1995

[N406](http://www.open-std.org/jtc1/sc22/wg9/n406.pdf), Procedures of the Ada Rapporteur Group

[N412](http://www.open-std.org/jtc1/sc22/wg9/n412.pdf), Instructions to the Ada Rapporteur Group from SC22/WG9 for Preparation of the Amendment to ISO/IEC 8652, 10 October 2002

[N414](http://www.open-std.org/jtc1/sc22/wg9/n414.pdf), Notification of Approval of Category C Liaisons between SC22/WG9 and Ada-Europe and SIGAda

[N416](http://www.open-std.org/jtc1/sc22/wg9/n416.htm), Charter of the Annex H Rapporteur Group (HRG)

[N417](http://www.open-std.org/jtc1/sc22/wg9/n417.htm), Charter of the ASIS Rapporteur Group (ASISRG)

[N423](http://www.open-std.org/jtc1/sc22/wg9/n423.pdf), Convenor's Comments on Instructions to the Ada Rapporteur Group from SC22/WG9 for Preparation of the Amendment to ISO/IEC 8652, December 2002

[N437](http://www.open-std.org/jtc1/sc22/wg9/n437.pdf), ARG Rapporteur's Proposal for Defining Scope of Amendment to ISO/IEC 8652:1995, 9 April 2004

[N456](http://www.open-std.org/jtc1/sc22/wg9/N456.pdf), Convenor Proposal for the Revision of the ASIS Standard, ISO/IEC 15291

[N457](http://www.open-std.org/jtc1/sc22/wg9/n457.pdf), Approved Plan for the Revision of the ASIS Standard, ISO/IEC 15291

[N459](http://www.open-std.org/jtc1/sc22/wg9/n459.txt), Disposition of Informal Comments Received on Editor's Draft of Amendment, 23 March 2006

[N460](http://www.open-std.org/jtc1/sc22/wg9/n460.pdf), Editor's Draft, Amendment 1 to ISO/IEC 8652, March 2006

[N462](http://www.open-std.org/jtc1/sc22/wg9/n462.pdf), JTC1 Directives, 5th edition, Version 2, April 2006 (JTC001-N-8122)

[N463](http://www.open-std.org/jtc1/sc22/wg9/n463.pdf), ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards

[N464r](http://www.open-std.org/jtc1/sc22/wg9/n464r.pdf), 2nd Preliminary draft New Work Item Proposal for the Revision of ISO/IEC 15291, ASIS

[N465](http://www.open-std.org/jtc1/sc22/wg9/N465.pdf), Response of ISO/IEC JTC1/SC22/WG9 to SC22 Resolution 5-15

[N467](http://www.open-std.org/jtc1/sc22/wg9/n467.pdf), Submission of ISO/IEC 8652:1995/FPDAM 1 to SC22 for FPDAM ballot

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